

## Abstract

The sandwich structure comprises of a light core and two thin laminates bonded to both sides of the core. A major problem with sandwich structures is delamination and debonding near the core/face sheet interface, particularly under impact loading, which can lead to an unexpected loss of structural integrity and catastrophic failure. Thus, it is important to investigate the impact behavior of sandwich structures. This study investigated the low-velocity impact (LVI) of polyvinyl chloride (PVC) core and glass fiber-reinforced polymer (GFRP) face sheet sandwich structures for marine applications. PVC foams of three different thicknesses were used as cores. GFRP face sheets of two different thicknesses were laid up in angle-ply [45/-45], cross-ply [0/90], and quasi-isotropic [0/45/-45/90] orientations. Several low-velocity impact tests were conducted at three different impact energies to characterize the energy levels. From the obtained data, the curves of force versus time, force versus displacement, and energy versus time were plotted. The results showed that the peak force increased with increasing energy impact. Furthermore, an increase in the core thickness increased the peak force, implying a high-energy absorption capability. The quasi-isotropic orientation exhibited better performance than the angle-ply and cross-ply orientations did. In conclusion, changing the thickness of the face sheet reduced the damaged area and perforation threshold of the sandwich structure.